REMARKS

Claims 1-51 are in the case and presented for reconsideration. Claims 1-16, 35, 42 and 47 have been amended. No new matter has been added.

Claims 1-15 and 42-51 have been rejected under 35 U.S.C. § 112, second paragraph, for being indefinite. Although the Applicant disagrees with the basis of this rejection, Claims 1, 12, 42 and 47 have been amended as outlined above in an effort to proceed with prosecution on the merits. Accordingly, these claims as amended particularly point out and distinctly claim the subject matter of the Applicant's invention.

Additionally, the Examiner asserts that:

> [T]he concept of generating signals at a location sensor and determining the location of the non-contact electrodes amounts to an intended use limitation of which Ben-Haim et al. and Goldreyer perform or are inherently capable of performing.

Applicant notes that the Examiner has not provided any showing (let alone a showing by clear and convincing evidence) that either Ben-Haim et al. (U.S. Patent No. 5,718,241) or Goldreyer (U.S. Patent No. 5,385,146) describe, suggest or infer the use of at least one location sensor on the body of a catheter for generating signals used to determine the location of an array of non-contact electrodes linearly arranged along the longitudinal axis of the body of the catheter. Neither of these two references include, not even an inference, of this novel feature and function of the Applicant's claimed invention. Additionally, there is absolutely no teaching in any of these references that suggest or infers that these novel features in function are inherent functions of the devices described in each of these prior art references.

Moreover, the Applicant would like to point out that it is well-established case law that use limitations in a claim can be sufficient basis to overcome an obviousness rejection. *In re Deminski*, 230 USPQ 313 (Fed. Cir. 1986). In this case, the Court of Appeals Federal Circuit has held that a claimed apparatus having functional limitations not found in the prior art were

not rendered obvious where there was no suggestion of the desireability of designing the prior art apparatus to perform the function of the claimed invention. *In re Deminski* at 315. And, it is noted that neither Ben-Haim et al. nor Goldreyer contain any suggestion that it would be desirable of redesigning their respective devices in a manner to perform this novel function of the Applicant's claimed invention. Therefore, the Examiner's statement quoted above is completely without legal basis.

Claims 1-3, 7, 9, 10, 12, 13, 15-18, 22, 24, 25, 32-37, 39-45 and 47-50 have been rejected under 35 U.S.C.§ 103 (a) as being unpatentable over Ben-Haim et al. in view of Goldreyer. Claims 4-6, 14, 19-21, 26-31, 38, 46 and 51 have been rejected under 35 U.S.C.§ 103 (a) as being unpatentable over Ben-Haim et al. and Goldreyer in view of U.S. Patent No. 6,104,944 (Martinelli). Claims 8, 11 and 23 have been rejected under 35 U.S.C.§ 103 (a) as being unpatentable of Ben-Haim and Goldreyer in view of U.S. Patent No. 6,171,306 (Swanson et al.).

Claim 1 has been amended in order to more particularly point out a catheter and console combination for mapping a chamber of a heart comprising a console comprising driver circuits operatively connected to at least one electromagnetic field generator for generating an electromagnetic field and a signal processor for determining location information; as well as a catheter comprising a body having a contact electrode at its distal tip and an array of non-contact electrodes on the distal end of the body linearly arranged along the longitudinal axis of the body and at least one location sensor on the distal end of the body for generating signals in response to the electromagnetic field which is used by the signal processor to determine a location of the contact electrode and a location of the non-contact electrode. The location of the non-contact electrodes are determined by the signal processor from the signals generated by the at least one location sensor and the signal processor uses the location of the non-contact electrodes to define a cloud of space representing a minimum volume of the chamber geometry of the heart.

Claim 12 has been amended in order to more particularly point out a catheter and console combination for mapping a chamber of the heart comprising a console comprising

driver circuits operatively connected to at least one electromagnetic field generator for generating an electromagnetic field and a signal processor for determining location information; as well as a catheter having a body with an array of non-contact electrodes on the distal end of the body linearly arranged along the longitudinal axis of the body. The catheter also comprises at least one location sensor approximate to the distal tip of the body for generating signals in response to the electromagnetic field which is used by the signal processor to determine a location of the non-contact electrodes. The location of the non-contact electrodes are determined by the signal processor from the signals generated by the at least one location sensor such that the signal processor uses the location of the non-contact electrodes to define a cloud of space representing a minimum volume of the chamber geometry of the heart.

Claim 16 as been amended in order to more particularly point out a method for generating an electrical map of a chamber of a heart comprising the steps of providing a catheter comprising a body, a contact electrode at the distal tip of the body, an array of non-contact electrodes on the distal end of the body that are linearly arranged along the longitudinal axis of the body, and at least one location sensor on the distal end of the body; advancing the catheter into the chamber of the heart; using a signal processor to determine a location of the contact electrode and the location of the non-contact electrodes using the at least one location sensor wherein the location of the non-contact electrodes define a cloud of space; contacting a wall of a chamber of the heart with the contact electrode at a plurality of contact points; acquiring electrical information and location information from each of the electrodes and the at least one location sensor respectively using the signal processor wherein the acquisition takes place over at least one cardiac cycle while the contact electrode is in contact with each of the contact points; determining a minimum volume of the heart chamber geometry with the signal processor using the defined cloud of space from the location of the non-contact electrode; and generating an electrical map of the heart chamber from the acquired location and electrical information.

Claim 35 has been amended in order to more particularly point out a method for generating an electrical map of a chamber of the heart comprising the steps of providing a catheter comprising a body, an array of non-contact electrodes on the distal end of the body

wherein the non-contact electrodes are linearly arranged along the longitudinal axis of the body and at least one location sensor proximate to the distal tip of the catheter; advancing the catheter into the chamber of the heart; using a signal processor to determine a location of the non-contact electrodes using the at least one location sensor wherein the location of the non-contact electrodes define a cloud of space; contacting a walled chamber of the heart with the distal tip of the catheter at a plurality of points; acquiring electrical information and location information from the non-contact electrodes and the at least one location sensor respectively using the signal processor such that the acquisition takes place over at least one cardiac cycle while the catheter distal tip is in contact with each of the contact points; determining a minimum volume of the heart chamber geometry with the signal processor using the defined cloud of space from the location of the non-contact electrodes and generating an electrical map of the heart chamber from the acquired location and electrical information.

Claim 42 has been amended in order to more particularly point out an apparatus for generating an electrical map of a chamber of the heart comprising a console comprising driver circuits operatively connected to at least one electromagnetic field generator for generating an electromagnetic field and a signal processor for determining location information; a catheter having a body with a distal tip and a contact electrode at the distal tip; an array of non-contact electrodes on the distal end of the body wherein the non-contact electrodes are linearly arranged along the longitudinal axis of the body and at least one location sensor on the distal end of the body for generating signals in response to the electromagnetic field which is used by the signal processor to determine a location of the contact electrode and a location of the non-contact electrodes. The signal processor uses the location of the non-contact electrodes to define a cloud of space representing a minimum volume of chamber geometry of the heart. The catheter is adapted to contact a wall of the chamber of heart with the contact electrode at a plurality of points and the signal processor is operatively connected to the catheter for acquiring electrical information and location information from each of the contact electrode and the non-contact electrodes and location sensors respectively over at least one cardiac cycle while the contact electrode is in contact with each of the contact points. The signal processor also generates an electrical map of the heart chamber from the acquired location and electrical information.

Claim 47 has been amended in order to more particularly point out an apparatus for generating an electrical map of a chamber of the heart comprising a console comprising driver circuits operatively connected to at least one electromagnetic field generator for generating an electromagnetic field and a signal processor for determining location information; a catheter having a body and a distal tip and an array of non-contact electrodes on the distal end of the body wherein the non-contact electrodes are linearly arranged along the longitudinal axis of the body and at least one location sensor proximate to the catheter distal tip for generating signals in response to the electromagnetic field which is used by the signal processor to determine a location of the non-contact electrodes. The location of the non-contact electrodes are determined by the signal processor from the signals generated by the at least one location sensor and the signal processor uses the location of the non-contact electrodes to define a cloud of space which is representative of a minimum volume of the chamber geometry of the heart. The catheter is also adapted to contact a wall of a chamber of the heart with the catheter of the distal tip at a plurality of contact points and the signal processor acquires electrical information and location information from each of the electrodes and location sensors respectively over at least one cardiac cycle which the catheter distal tip is in contact with each of the contact points. The signal processor also generates an electrical map of the heart chamber from the acquired location and electrical information.

The support for the amendments to the Applicant's claimed invention as outlined above can be found in the Applicant's Specification, for example, Page 11, Line 14 – Page 12, Line 24.

Accordingly, it is clear from the Applicant's claimed present invention as amended that there are novel features and functions (to include novel method steps) that are simple not found in any of the cited prior art references, either alone or in combination with each other. For example, it is simply neither described nor suggested in any of these references (even when combined) to utilize a catheter and console combination for mapping a chamber of the heart comprising a catheter having a body, a contact electrode at the distal tip of the body, an array of non-contact electrodes at the distal end of the body linearly arranged along the longitudinal axis of the body, and at least one location sensor on the distal end of the body for generating signals in response to the electromagnetic field which is used by the signal processor to determine the

location of the contact electrode and the location of the non-contact electrodes and wherein the signal processor uses the location of the non-contact electrodes to define a cloud of space which represents a minimum volume of the chamber geometry of the heart. These references are also completely silent with respect to an alternative embodiment of the present invention (catheter and console combination and method for generating an electrical map of a chamber of a heart) that utilizes a catheter body having an array of non-contact electrodes only, i.e. without a contact electrode, however, including the other novel features and steps outlined above.

Additionally, there is absolutely no teaching, suggestion or inference from any of these cited prior art references that one of ordinary skill in this field could make the necessary changes to the devices of the cited prior art references (assuming this is even feasible based on the particular prior art designs described) in order to arrive at Applicant's novel claimed invention. Moreover, there is absolutely no suggestion or motivation that can be taken from any of these cited prior art references to make these types of required changes to either the Goldreyer device, Ben-Haim et al device, Martinelli device, etc. that would ever arrive at the Applicant's claimed present invention. There simply is no clear and convincing evidence in the record that proves that the skilled artisan in this field would be motivated or lead to the Applicant's novel claimed invention.

Accordingly, by this Amendment and for the reasons above, the cited prior art references neither describe, suggest or infer the Applicant's claimed present invention. Therefore, the Applicant 's claimed present invention is neither anticipated by nor rendered obvious by these references and favorable action is respectfully requested.

Respectfully submitted,

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